

**WHAT IS CLAIMED IS:**

1. A coating composition for the chemical grafting of an oil, fuel, coolant or air filter material, the composition comprises:  
about 30-50% by weight of an aqueous acrylic resin,  
about 3-11 % by weight of a high molecular weight silicone in an aqueous suspension,  
about 20-40 % by weight of deionized, distilled or otherwise pure water,  
about 5-16 % by weight of a binder,  
about less than 1% by weight of a catalyst, and  
about less than 1% by weight of a graft initiator.
2. The composition according to claim 1, wherein the aqueous acrylic resin is an acrylic copolymer.
3. The composition according to claim 1, wherein the binder is an aliphatic polyurethane.
4. The composition according to claim 1, wherein the catalyst is at least one selected from hydrogen peroxidem, urea peroxide, ammonium persulfate, potassium persulfate, sodium metabisulfate and mixtures thereof.

5. The composition according to claim 1, wherein the graft initiator is at least one selected from metal ion systems containing  $\text{Fe}^{+++}$ ,  $\text{Fe}^{++}$ ,  $\text{Ag}^+$ ,  $\text{Co}^{++}$ ,  $\text{Cu}^{++}$  and mixtures thereof.

6. The composition according to claim 1, wherein the catalyst is urea peroxide.

7. The composition according to claim 1, wherein the graft initiator is silver nitrate.

8. A coating composition for the chemical grafting of an oil, fuel, coolant or air filter material, the composition comprises:

about 20-40% by weight of a monomer,

about 20-40 % by weight of isopropyl alcohol,

about 20-40 % by weight of deionized, distilled or otherwise pure water,

about 4-15 % by weight of an ester,

about less than 4% by weight of a catalyst, and

about less than 1% by weight of a graft initiator.

9. The composition according to claim 8, which further comprises about less than 0.5 % by weight of a prepolymer.

10. The composition according to claim 9, wherein the prepolymer is a polyacrylamide polymer.

11. The composition according to claim 8, wherein the monomer is 2-acrylamido-2-methylpropanesulfonic acid sodium salt, 50% aqueous solution.

12. The composition according to claim 8, wherein the ester is a monomeric methacrylate ester.

13. The composition according to claim 8, wherein the ester is 2-hydroxyethyl methacrylate.

14. The composition according to claim 8, wherein the catalyst is at least one selected from the group consisting of hydrogen peroxide, urea peroxide, ammonium persulfate, potassium persulfate, sodium metabisulfate and mixtures thereof.

15. The composition according to claim 9, which further comprises about less than 0.5 % by weight of a bacteriacide.

16. The composition according to claim 15, wherein the

bacteriacide is a carbamate.

17. An oil, fuel, coolant or air filter comprising a filter material and a composition which chemically grafts to the filter material,

wherein the filter material is at least one selected from the group consisting of cotton, paper-based materials, synthetic materials and combinations thereof, and

wherein the composition comprises:

about 20-40% by weight of a monomer,

about 20-40 % by weight of isopropyl alcohol,

about 20-40 % by weight of deionized, distilled or otherwise pure water,

about 4-15 % by weight of an ester,

about less than 4% by weight of a catalyst, and

about less than 1% by weight of a graft initiator.

18. A process for making an oil, fuel, coolant or air filter comprising the steps of:

- a. making a composition to chemically graft to a filter substrate,
- b. chemically grafting the composition to the filter substrate.

19. The process according to claim 18, wherein the making step comprises:

mixing about 20-40 % by weight of deionized, distilled or otherwise pure water,

about 20-40% by weight of a monomer,

about 20-40 % by weight of isopropyl alcohol,

about 4-15 % by weight of an ester,

about less than 4% by weight of a peroxide-based catalyst, and

about less than 1% by weight of a graft initiator.

20. The process according to claim 19 which further comprises the addition of about less than 0.5 % by weight of a prepolymer before mixing in the monomer.

21. The process according to claim 20, wherein the prepolymer is a polyacrylamide polymer mixed with water at temperature between about 60-100 degrees C.

22. The process according to claim 20, wherein the polyacrylamide polymer is mixed with water at temperature between about 60-100 degrees C and then is mixed with a bacteriacide, prior to mixing with any other ingredients.

23. The process according to claim 18, wherein the chemically grafting step comprises:

chemically grafting the composition to the filter substrate by immersing the filter substrate in the composition.

24. The process according to claim 23, wherein the chemically grafting step further comprises:

squeezing the filter substrate to remove excess composition.

25. The process according to claim 18, wherein the chemically grafting step comprises:

chemically grafting the composition to the filter substrate by immersing the filter substrate in the composition, and curing the filter substrate at about 200-300 degrees F.

26. A coating composition for the chemical grafting of an oil, fuel, coolant or air filter material, the composition comprises:

about less than 1% by weight of a polyacrylamide prepolymer,

about 20-40% by weight of deionized, distilled or otherwise pure water,

about 20-40% by weight of mono 2-acrylamido-2-methyl propane sulfonic acid salt, 50% aqueous solution,

about 20-40% by weight of an alcohol-based solvent,

about 4-15% by weight of a monomer ester,

about less than 6% by weight of a catalyst, and

about less than 2% by weight of a graft initiator.

27. A coating composition for the chemical grafting of an oil, fuel, coolant or air filter material, the composition comprises:

about less than 1% by weight of a polyacrylamide prepolymer,

about 20-40% by weight deionized, distilled or otherwise pure water,

about 20-40% by weight mono 2-acrylamido-2-methyl propane sulfonic acid salt, 50% aqueous solution,

about 20-40% by weight isopropyl alcohol,

about 4-15% by weight 2-hydroxy ethyl methacrylate,

about less than 6% by weight of a catalyst, wherein the catalyst is at least one selected from the group consisting of ammonium persulfate, sodium metabisulfate, hydrogen peroxide, and mixtures thereof, and

about less than 2% by weight silver nitrate.

28. An oil, fuel, coolant or air filter comprising a filter material to which is chemically grafted a polymer or copolymer, whereby the chemically grafted polymer or copolymer results from the treatment of a chemical composition to the filter material, and wherein the chemical composition comprises:

about 20-40% by weight of a monomer,

about 20-40 % by weight of alcohol,

about 20-40 % by weight of deionized, distilled or otherwise pure water,

about 4-15 % by weight of an ester,

about less than 6% by weight of a catalyst, and

about less than 2% by weight of a graft initiator.

29. An oil, fuel, coolant or air filter according to claim 28, wherein the filter material is at least one selected from the group consisting of a cellulose-based material, a synthetic material, and combinations thereof.

30. An oil, fuel, coolant or air filter according to claim 29, wherein the cellulose-based material is a cotton material.

31. An oil, fuel, coolant or air filter according to claim 29, wherein the cellulose-based material is a paper material.

32. An oil, fuel, coolant or air filter according to claim 29, wherein the synthetic material is at least one selected from the group consisting of an acrylic, polyester and combinations thereof.

33. A method of filtering oil, fuel, coolant or air comprising: passing the oil, fuel or air to be filtered through a filter comprising a filter material to which is chemically grafted a polymer or copolymer, whereby



the chemically grafted polymer or copolymer results from the treatment of a chemical composition to the filter material, and wherein the chemical composition comprises:

about 20-40% by weight of a monomer,

about 20-40 % by weight of isopropyl alcohol,

about 20-40 % by weight of deionized, distilled or otherwise pure

water,

about 4-15 % by weight of an ester,

about less than 6% by weight of a catalyst, and

about less than 2% by weight of a graft initiator.